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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,929	06/19/2007	Makoto Minakata	31721-236974	5775
26694	7590	02/07/2008		
VENABLE LLP P.O. BOX 34385 WASHINGTON, DC 20043-9998			EXAMINER LEPISTO, RYAN A	
			ART UNIT 2883	PAPER NUMBER
			MAIL DATE 02/07/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/594,929	Applicant(s) MINAKATA, MAKOTO	
	Examiner Ryan Lepisto	Art Unit 2883	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 5 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/29/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement filed 9/26/06 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document and all other information or that portion which caused it to be listed. It has been placed in the application file, but the references BA-BE referred to therein have not been considered.

### ***Election/Restrictions***

**Claim 4** is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/27/07.

### ***Claim Objections***

**Claim 3** recites the limitation "the mixing". There is insufficient antecedent basis for this limitation in the claim.

### ***Specification***

The disclosure is objected to because of the following informalities: The specification refers to the claims (page 4), but since claims can be dynamic, reference to them in the specification should be either removed or care should be taken to update the specification when/if the claims are amended. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoo (US 5,434,700)** in view of **Bhat et al (US 5,796,902)** (Bhat).

Yoo teaches an image wavelength conversion device (Figs. 1, 2, 4) wherein a 1x4 array of quasi-phase-matching frequency generating optical waveguides (40 shown in Figs. 4) having constant openings and are aligned in a array with an incident plane (where the light enters) and an exit plane (where the light exits) wherein incident light ( $\omega_1$ ), excitation light ( $\omega_p$ ) are incident on the waveguides (40) on an incident end to generate an output light ( $\omega_1'$ ) at the exit end taught by Yoo as being difference frequency generation and image receiving means (14) for receiving the output light (column 3 lines 35-50, column 5 lines 35-50).

Yoo does not teach expressly sum frequency generation ( $(\lambda_1)^{-1} + (\lambda_2)^{-1} = (\lambda_3)^{-1}$ ).

Bhat teaches the same individual quasi-phase-matching waveguide (Fig. 1) but also teaches that this structure can be used for difference or sum frequency generation (column 10 lines 43-55).

Yoo and Bhat are analogous art because they are from the same field of endeavor, image wavelength conversion devices.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Bhat to employ the identical structure of Yoo as a sum frequency generation optical waveguide.

The motivation for doing so would have been to be able to use the device as a tunable coherent source over a wide wavelength range because of the interaction of the incident and excitation source (Bhat, column 10 line 65 - column 11 line 3).

***Allowable Subject Matter***

**Claim 2** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: This claim would be allowable over the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims because the latter, either alone or in combination, does not disclose nor render obvious an image wavelength conversion device as described in claim 1 in combination with the incident light being most preferable an infrared light of 3.5  $\mu\text{m}$ , an excitation light of 0.8  $\mu\text{m}$  and an output light of 0.65  $\mu\text{m}$ , in combination with the rest of the claimed limitations.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references all teach either quasi-phase-matching sum frequency generating optical waveguides or a system using them in image wavelength conversion:

US 5028107	US 5036220	US 5295218	US 5341449
US 5504616	US 5732177	US 5815307	US 5912910
US 6445491 B2	US 6806986 B2	US 2006/0109542 A1	

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-Th 7:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/594,929  
Art Unit: 2883

Page 6

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



/RAL/  
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Art Unit 2883

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Technology Center 2800